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ning of each regular issue of the PCT Gazette.*

(54) Title: FLUORESCENCE TECHNIQUE FOR ON-LINE MONITORING OF STATE OF HYDROGEN-PRODUCING MI-
CROORGANISMS

(57) Abstract: *In situ* fluorescence method to monitor state of sulfur-deprived algal culture's ability to produce H₂ under sulfur depletion, comprising: a) providing sulfur-deprived algal culture; b) illuminating culture; c) measuring onset of H₂ percentage in produced gas phase at multiple times to ascertain point immediately after anaerobiosis to obtain H₂ data as function of time; and d) determining any abrupt change in three *in situ* fluorescence parameters; i) increase in F_i (steady-state level of chlorophyll fluorescence in light adapted cells); ii) decrease in F_m' (maximal saturating light induced fluorescence level in light adapted cells); and iii) decrease in $\Delta F/F_m' = (F_m' - F_i)/F_m'$ (calculated photochemical activity of photosystem II (PSII) signaling full reduction of plastoquinone pool between PSII and PSI, which indicates start of anaerobic conditions that induces synthesis of hydrogenase enzyme for subsequent H₂ production that signal oxidation of plastoquinone pool as main factor to regulate H₂ under sulfur depletion.



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